CLAIMS:

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is as follows:

1. A method for filling vias in a wafer, comprising:
evacuating air from the vias;
trapping at least a portion of the wafer and a paste for filling the vias between two surfaces; and
pressurizing the paste to fill the via.

2. The method as recited in claim 1, further comprising forming a seal between the surfaces so as to enclose said portion of the wafer and said paste.

3. The method as recited in claim 2, further comprising moving the seal over successive portions of the wafer to fill the vias.

4. The method as recited in claim 1, further comprising:
placing the paste on a planar surface facing the wafer; and
moving the planar surface upon which the paste is placed into contact with the wafer.

5. The method as recited in claim 1, further comprising injecting the paste between one of said surfaces and the wafer.

6. The method as recited in claim 1, further comprising injecting the paste between one of said surfaces and the wafer after evacuating the air from said vias.

7. The method as recited in claim 1, further comprising:

providing an evacuated space between said surfaces; and

forcing said surfaces together to force said paste into the vias.

8. The method as recited in claim 7, wherein said surfaces are forced together by atmospheric pressure.

9. The method as recited in claim 1, wherein the paste is pressurized to greater than atmospheric pressure.

10. The method as recited in claim 1, wherein the paste is pressurized to a pressure in the range of 10 to 100 PSI.

11. The method of claim 1, wherein said vias are blind vias.

12. An apparatus for filing vias in a wafer, comprising:

a chamber in which to place the wafer, said chamber being capable of being evacuated;

a surface upon which to place said wafer;

a paste delivery portion for providing a paste to fill said vias; and

a paste filling portion for bringing said paste into contact with said vias under pressure so that said paste fills said vias.

13. The apparatus as recited in claim 12, wherein said paste filling portion provides said paste at a pressure with the range of 10 to 100 PSI.

14. The apparatus as recited in claim 12, wherein said paste delivery portion comprises:

a surface onto which said paste is deposited; and

a mechanism for applying pressure so that said paste on said surface is forced into contact with said wafer.

15. The apparatus as recited in claim 14, wherein said paste delivery portion comprises:

a surface onto which said paste is deposited; and

a passageway through which said paste is delivered to said surface.

16. The apparatus as recited in claim 14, wherein said mechanism for applying pressure comprises:

a plate which defines said surface; and

components for applying a pressure differential to said plate so as to force said plate toward said wafer.

17. The apparatus as recited in claim 16, further comprising a compliant material on said surface to which said paste is applied.

18. The apparatus as recited in claim 12, wherein said paste filling portion comprises:

a plate having a portion for receiving said paste;

a first seal for sealing said plate to said surface upon which said wafer is placed;

a second seal for sealing said paste between said plate and said plate and said wafer; and

a mechanism for forcing said plate towards said wafer so that said paste is forced into said vias of said wafer.

19. The apparatus as recited in claim 18, wherein said mechanism for forcing said plate towards said wafer comprises:

gas removal apparatus for evacuating gas between said plate and said surface upon which said wafer is placed; and

gas replacement apparatus for replacing gas evacuated from said chamber.

20. The apparatus as recited in claim 19, wherein said gas replacement apparatus comprises an opening through which gas is permitted to enter said chamber.

21. The apparatus as recited in claim 12, wherein said surface upon which to place said wafer comprises a base plate having a recess for said wafer.

22. The apparatus as recited in claim 21, wherein said surface upon which to place said wafer comprises a surface of an electrostatic chuck.

23. The apparatus as recited in claim 12, wherein said paste delivery portion comprises a pressurized paste reservoir.

24. The apparatus as recited in claim 12, wherein said paste filling portion comprises:

a piston housing having an opening for receiving a piston;

a compliant seal for sealing said piston housing to a portion of said wafer so as to confine said paste;

a piston disposed in said piston housing; and

a piston actuator for forcing said piston toward said wafer;

wherein said paste delivery portion provides said paste to said opening.

25. The apparatus as recited in claim 24, further comprising:

a mechanism for moving said piston housing so that said seal is compressed for filing said vias.

26. The apparatus as recited in claim 25, wherein said mechanism for moving said piston housing further moves said piston housing to a position wherein said seal is compressed to a lesser degree than when said vias are filled, to thereby allow said piston housing to be moved so that said piston housing is disposed so as to be in a position to fill vias of one or more successive portions of said wafer with paste delivered to said opening.

27. The apparatus as recited in claim 24, further comprising a mechanism for cleaning said piston of excess paste after vias of a wafer have been filled.

28. The apparatus as recited in claim 12, wherein said paste filling portion comprises:

an elongate member having a surface with a slot through which paste is provided to said wafer; and

a compliant seal for sealing said surface to said wafer.

29. The apparatus as recited in claim 28, further comprising a mechanism for translating said member and said wafer with respect to one another so as to fill vias in successive portions of said wafer.

30. The apparatus as recited in claim 28, further comprising a mechanism for rotating said member and said wafer with respect to one another so as to fill vias in successive portions of said wafer.

31. The apparatus as recited in claim 30, wherein said mechanism for rotating said member and said wafer with respect to one another comprising a rotating base having said surface upon which said wafer is placed.

32. The apparatus as recited in claim 28, configured to accept a circular wafer, wherein said elongate member is disposed radially with respect to said wafer.

33. The apparatus as recited in claim 32, wherein said elongate member has a length less than that a radius of said wafer, wherein said apparatus further comprises:

a mechanism for rotating said wafer; and

a mechanism for radially translating said member in a radial direction with respect to said wafer.

34. The apparatus as recited in claim 33, wherein said mechanism for rotating said wafer includes a rotation speed control to control speed of rotation of said wafer.

35. The apparatus as recited in claim 33, wherein said mechanism for radially translating said member includes a translation speed control to control speed of translation of said member with respect to said wafer.

36. The apparatus as recited in claim 33, wherein said mechanism for radially translating said member includes a worm gear assembly, and a motor for rotating a drive shaft of said assembly.